

Pressure sensor with ceramic and metal sensors

# Cerabar PMC21 / PMP21



PMC21

PMP21

 Complete product information:  
[www.e-direct.endress.com/pmx21](http://www.e-direct.endress.com/pmx21)

- High reproducibility and long-term stability
- Customized measuring ranges
- Flush-mounted process connection as option

**i** Specs at a glance:

- **Media:**  
Gases, vapors, liquids and dust
- **Output:**  
4 to 20 mA
- **Process temperature:**  
-40 to +100 °C (-40 to +212 °F)
- **Measuring ranges:**  
From -100 to +100 mbar (-1.5 to +1.5 psi) to -1 to +400 bar (-15 to +6000 psi)
- **Reference accuracy:**  
±0.3 %

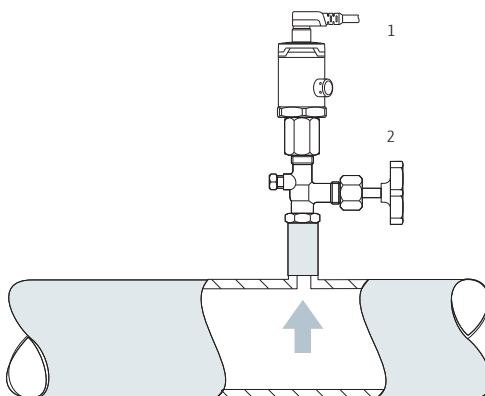
**Application** The Cerabar is a pressure sensor for the measurement of absolute and gauge pressure in gases, vapors, liquids and dust. The Cerabar can be used internationally thanks to a wide range of approvals and process connections.

**Function**

**Ceramic process isolating diaphragm:**  
 The ceramic sensor is an oil-free sensor, i.e. the process pressure acts directly on the robust ceramic process isolating diaphragm and causes it to deflect. A pressure-dependent change in capacitance is measured at the electrodes of the ceramic substrate and the process isolating diaphragm.

**Metallic process isolating diaphragm:**  
 The process pressure deflects the metal process isolating diaphragm of the sensor and a fill fluid transfers the pressure to a Wheatstone bridge (semiconductor technology). The pressure-dependent change in the bridge output voltage is measured and evaluated.

**Application example**



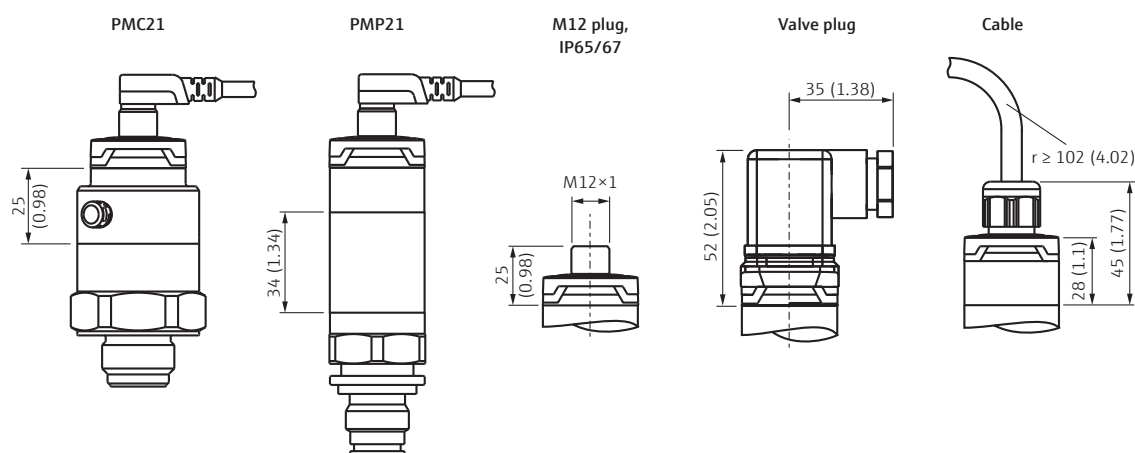
Pressure sensor Cerabar (1) with the shutoff device (2) in pipelines

## Technical data

Output		Process	
Output signal	4 to 20 mA (two-wire)	Process temperature range	PMC21: -25 to +100 °C (-13 to +212 °F); for oxygen applications: -10 to +60 °C (+14 to +140 °F); PMP21: -40 to +100 °C (-40 to +212 °F)
Signal range 4 to 20 mA	3.8 to 20.5 mA		
Load 4 to 20 mA	$R_{Lmax} \leq (U_B - 6.5 V) / 22 mA^1$		
Signal on alarm 4 to 20 mA	max. alarm >21 mA; min. alarm current adjustable		
Dynamic behavior	Time constant (T <sub>90</sub> ) 15 ms		
<sup>1</sup> R <sub>Lmax</sub> : maximum load resistance; U <sub>B</sub> : supply voltage			
Power supply		Materials PMC21	
Supply voltage	10 to 30 V DC	Materials not in contact with process	Housing: Stainless steel 316L (1.4404)
Current consumption	≤26 mA	Materials in contact with process	Process connections: 316L (1.4435); Ceramic process isolating diaphragm: Al <sub>2</sub> O <sub>3</sub> in accordance with FDA; TSE Certificate of Suitability for all device components in contact with the process; Seal: Viton FKM or EPDM
Degree of protection	Cable: IP66/68 NEMA Type 4X/6P Plug M12: IP65/67 NEMA Type 4X Valve plug: IP65 NEMA Type 4X		
Influence of power supply	≤0.005 % of URL/1 V		
Residual ripple	±5 %		
Performance characteristics		Materials PMP21	
Reference accuracy	±0.3 %	Materials not in contact with process	Housing: Stainless steel 316L (1.4404); Filling oil: NSF-H1 synthetic oil in accordance with FDA 21 CFR 178.3570
Thermal change of the zerooutput and the output span	<1 bar (15 psi): <1.2 %; ≥1 bar (15 psi): <1 %	Materials in contact with process	Process connections: 316L; Metallic process isolating diaphragm: AISI 316L (1.4435); TSE Certificate of Suitability for all device components in contact with the process; With flush-mounted process isolating diaphragm: Seal: Viton FKM
Long-term stability	1 year: ±0.2 %; 5 years: ±0.4 %; 8 years: ±0.45 %		
Switch-on time	≤2 s		
Environment		Approvals	
Ambient temperature range	-40 to +85 °C (-40 to +185 °F) Devices for hazardous areas: -40 to +70 °C (-40 to +158 °F)	Ex	ATEX II 1/2G Ex ia IIC T4 Ga/Gb ATEX II 3G EEx eC IIC T4 Gc CSA C/US IS Cl. I Div. 1 Gr. A-D FM IS Cl. I, Div.1 Gr. A-D T4 IEC Ex ia IIC T4 Ga/Gb NEPSI Ex ia IIC T4
Storage temperature range	-40 to +85 °C (-40 to +185 °F)		Pressure Equipment Directive
Climate class	Class 3K5		
Electromagnetic compatibility	- Interference emission as per EN 61326 equipment B - Interference immunity as per EN 61326 appendix A (industrial sector) - NAMUR recommendation EMC (NE21)		

## Dimensions in mm (inches)

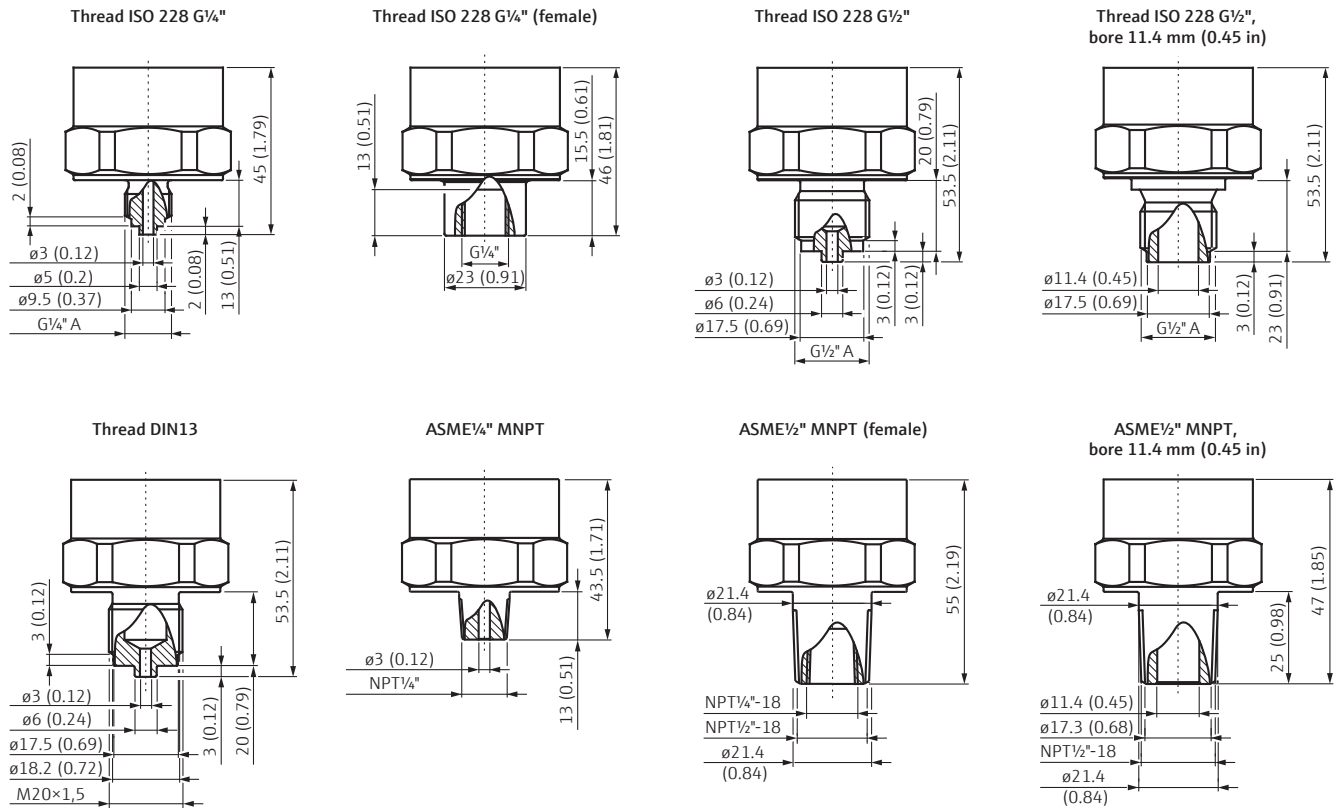
### Housing



Installation according to instruction manual.

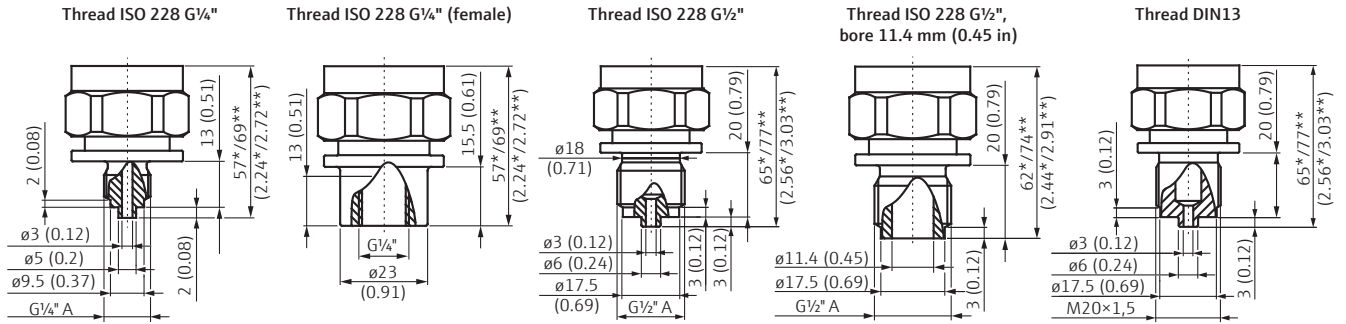
Dimensions process connections PMC21 in mm (inches)

Process connections with internal, ceramic process isolating diaphragm

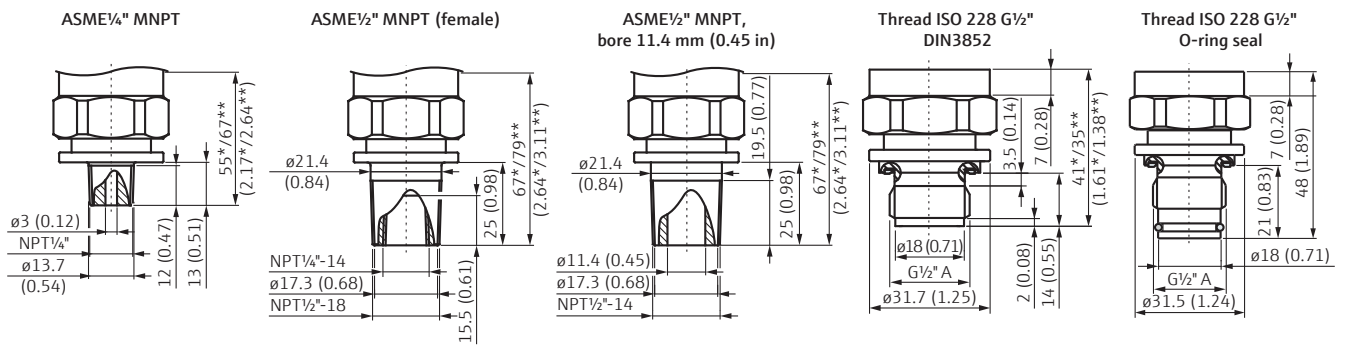


**Dimensions process connections PMP21 in mm (inches)**

**Process connections with internal, metallic process isolating diaphragm**



**Process connections with flush-mounted, metallic process isolating diaphragm**

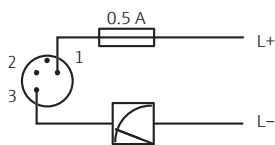


\* to 100 bar (1500 psi) / \*\* 400 bar (6000 psi)

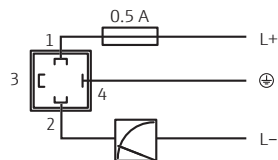
**Electrical connection**

**4 to 20 mA output**

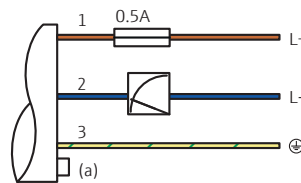
**M12 plug**



**Valve plug**



**Cable**



**Cable:**

- 1: brown = L+
- 2: blue = L-
- 3: green/yellow = ground connection
- (a): reference air hose

Price table

Electrical connection

Code	Plug
M	Plug M12
U	Valve plug M16
V	Valve plug NPT½"

Sensor range

Code	Range (relative)
1C	100 mbar/10 kPa/1.5 psi, overload: 4 bar/400 kPa/60 psi
1E	250 mbar/25 kPa/3.75 psi, overload: 5 bar/500 kPa/75 psi
1F	400 mbar/40 kPa/6 psi, overload: 1.6 bar/160 kPa/24 psi
1H	1 bar/100 kPa/15 psi, overload: 4 bar/400 kPa/60 psi
1K	2 bar/200 kPa/30 psi, overload: 18 bar/1.8 MPa/270 psi
1M	4 bar/400 kPa/60 psi, overload: 25 bar/2.5 MPa/375 psi
1N	6 bar/600 kPa/90 psi, overload: 40 bar/4 MPa/600 psi
1P	10 bar/1 MPa/150 psi, overload: 40 bar/4 MPa/600 psi
1Q	16 bar/1.6 MPa/240 psi, overload: 60 bar/6 MPa/900 psi
1R	25 bar/2.5 MPa/375 psi, overload: 60 bar/6 MPa/900 psi
1S	40 bar/4 MPa/600 psi, overload: 60 bar/6 MPa/900 psi

Sensor range

Code	Range (absolute)
2C	100 mbar/10 kPa/1.5 psi, overload: 4 bar/400 kPa/60 psi
2E	250 mbar/25 kPa/3.75 psi, overload: 5 bar/500 kPa/75 psi
2F	400 mbar/40 kPa/6 psi, overload: 1.6 bar/160 kPa/24 psi
2H	1 bar/100 kPa/15 psi, overload: 4 bar/400 kPa/60 psi
2K	2 bar/200 kPa/30 psi, overload: 18 bar/1.8 MPa/270 psi
2M	4 bar/400 kPa/60 psi, overload: 25 bar/2.5 MPa/375 psi
2P	10 bar/1 MPa/150 psi, overload: 40 bar/4 MPa/600 psi
2S	40 bar/4 MPa/600 psi, overload: 60 bar/6 MPa/900 psi

Calibration, unit

Code	Version
B	Sensor range; mbar/bar/psi
J	Customized; please specify measuring range in your order

Seal

Code	Version
A	FKM
J	EPDM

Cerabar PMC21

Approval	Electrical conn.	Process connection	Order no.	Price/pcs. in €			
				1 to 3	4 to 10	11 to 35	
Non hazardous area	M12 / ISO4400	Thread ISO228 G¼" (internal)	PMC21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ <input type="checkbox"/>	229.-	206.-	188.-	
		Thread ISO228 G½" EN837	PMC21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ <input type="checkbox"/>	229.-	206.-	188.-	
		Thread ISO228 G¼" EN837	PMC21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ <input type="checkbox"/>	229.-	206.-	188.-	
		Thread ISO228 G½", bore 11.4 mm (0.45 in)	PMC21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ <input type="checkbox"/>	229.-	206.-	188.-	
	5 m cable	Thread ISO228 G¼" (internal)	PMC21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ <input type="checkbox"/>	249.-	224.-	204.-	
		Thread ISO228 G½" EN837	PMC21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ <input type="checkbox"/>	249.-	224.-	204.-	
		Thread ISO228 G¼" EN837	PMC21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ <input type="checkbox"/>	249.-	224.-	204.-	
		Thread ISO228 G½", bore 11.4 mm (0.45 in)	PMC21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ <input type="checkbox"/>	249.-	224.-	204.-	
	Ex	M12 / ISO4400	Thread ISO228 G¼" (internal)	PMC21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ <input type="checkbox"/>	297.-	267.-	243.-
			Thread ISO228 G½" EN837	PMC21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ <input type="checkbox"/>	297.-	267.-	243.-
			Thread ISO228 G¼" EN837	PMC21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ <input type="checkbox"/>	297.-	267.-	243.-
			Thread ISO228 G½", bore 11.4 mm (0.45 in)	PMC21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ <input type="checkbox"/>	297.-	267.-	243.-
5 m cable		Thread ISO228 G¼" (internal)	PMC21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ <input type="checkbox"/>	317.-	286.-	260.-	
		Thread ISO228 G½" EN837	PMC21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ <input type="checkbox"/>	317.-	286.-	260.-	
		Thread ISO228 G¼" EN837	PMC21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ <input type="checkbox"/>	317.-	286.-	260.-	
		Thread ISO228 G½", bore 11.4 mm (0.45 in)	PMC21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ <input type="checkbox"/>	317.-	286.-	260.-	

\* Please add code for electrical connection, sensor range, calibration and seal.

Accessories

	Order no.	Price/pcs. in €		
Weld-in adapter G½, 316L	52002643		53.02	
Weld-in adapter G1, 316L	52010171		125.30	
5 m cable with M12×1 plug	52010285		7.25	
Straight plug, without cable (self wired)	52006263		15.55	
M12×1 plug angled	71114212		25.41	
Display PHX20 for Cerabar with analog output	52022914	144.-	134.-	127.-

### Electrical connection

Code	Plug
M	Plug M12
U	Valve plug M16
V	Valve plug NPT½"

### Sensor range

Code	Range (relative)
1F	400 mbar/40 kPa/6 psi, overload: 1.6 bar/160 kPa/24 psi
1H	1 bar/100 kPa/15 psi, overload: 4 bar/400 kPa/60 psi
1K	2 bar/200 kPa/30 psi, overload: 18 bar/1.8 MPa/270 psi
1M	4 bar/400 kPa/60 psi, overload: 25 bar/2.5 MPa/375 psi
1N	6 bar/600 kPa/90 psi, overload: 40 bar/4 MPa/600 psi
1P	10 bar/1 MPa/150 psi, overload: 40 bar/4 MPa/600 psi
1Q	16 bar/1.6 MPa/240 psi, overload: 60 bar/6 MPa/900 psi
1R	25 bar/2.5 MPa/375 psi, overload: 60 bar/6 MPa/900 psi
1S	40 bar/4 MPa/600 psi, overload: 60 bar/6 MPa/900 psi
1U	100 bar/10 MPa/1500 psi, overload: 160 bar/16 MPa/2400 psi
1W	400 bar/40 MPa/6000 psi, overload: 600 bar/60 MPa/9000 psi

### Sensor range

Code	Range (absolute)
2F	400 mbar/40 kPa/6 psi, overload: 1.6 bar/160 kPa/24 psi
2H	1 bar/100 kPa/15 psi, overload: 4 bar/400 kPa/60 psi
2K	2 bar/200 kPa/30 psi, overload: 18 bar/1.8 MPa/270 psi
2M	4 bar/400 kPa/60 psi, overload: 25 bar/2.5 MPa/375 psi
2P	10 bar/1 MPa/150 psi, overload: 40 bar/4 MPa/600 psi
2S	40 bar/4 MPa/600 psi, overload: 60 bar/6 MPa/900 psi
2U	100 bar/10 MPa/1500 psi, overload: 160 bar/16 MPa/2400 psi
2W	400 bar/40 MPa/6000 psi, overload: 600 bar/60 MPa/9000 psi

### Calibration, unit

Code	Version
B	Sensor range; mbar/bar/psi
J	Customized; please specify measuring range in your order

Cerabar PMP21			Order no.	Price/pcs. in €		
Approval	Electrical conn.	Process connection		1 to 3	4 to 10	11 to 35
Non hazardous area	M12 / ISO4400	Thread ISO228 G¼" (internal)	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ	225.-	202.-	184.-
		Thread ISO228 G½" EN837	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ	225.-	202.-	184.-
		Thread ISO228 G½". flush-mounted	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WJJ	225.-	202.-	184.-
		Thread ISO228 G¼" EN837	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ	225.-	202.-	184.-
		Thread ISO228 G½". bore 11.4 mm (0.45 in)	PMP21-AA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ	225.-	202.-	184.-
	5 m cable	Thread ISO228 G¼" (internal)	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ	245.-	220.-	201.-
		Thread ISO228 G½" EN837	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ	245.-	220.-	201.-
		Thread ISO228 G½". flush-mounted	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WJJ	245.-	220.-	201.-
		Thread ISO228 G¼" EN837	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ	245.-	220.-	201.-
		Thread ISO228 G½". bore 11.4 mm (0.45 in)	PMP21-AA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ	245.-	220.-	201.-
Ex	M12 / ISO4400	Thread ISO228 G¼" (internal)	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ	293.-	263.-	240.-
		Thread ISO228 G½" EN837	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ	293.-	263.-	240.-
		Thread ISO228 G½". flush-mounted	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WJJ	293.-	263.-	240.-
		Thread ISO228 G¼" EN837	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ	293.-	263.-	240.-
		Thread ISO228 G½". bore 11.4 mm (0.45 in)	PMP21-BA1 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ	293.-	263.-	240.-
	5 m cable	Thread ISO228 G¼" (internal)	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WAJ	313.-	282.-	257.-
		Thread ISO228 G½" EN837	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WBJ	313.-	282.-	257.-
		Thread ISO228 G½". flush-mounted	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WJJ	313.-	282.-	257.-
		Thread ISO228 G¼" EN837	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WTJ	313.-	282.-	257.-
		Thread ISO228 G½". bore 11.4 mm (0.45 in)	PMP21-BA1 A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> WWJ	313.-	282.-	257.-

\* Please add code for electrical connection, sensor range and calibration.


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Weld-in adapter G1. 316L	52010171		125.30	
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M12×1 plug angled	71114212		25.41	
Display PHX20 for Cerabar with analog output	52022914	144.-	134.-	127.-


Prices are applicable for Malta until 30/06/2020, in euro per unit, net excluding value added tax (VAT), cost of packing and dispatch. Endress+Hauser retains the right to change or modify pricing at any time. The terms of sales and delivery of Endress+Hauser are applicable. Current prices and delivery times can be verified prior to ordering on [www.e-direct.endress.com](http://www.e-direct.endress.com).

 Complete product information:  
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iTHERM ModuLine TM101

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RMA42